

Preignition Conversion of Methane
Hydrocarbons in Internal Combustion
Engines

77653
SOV/80-33-2-28/52

compressed without ignition, and expelled into a large, water- or dry ice-cooled flask. The tests were made at 1,000 rpm, 110° temperature of the gaseous mixture, and only a 4.33 compression ratio to avoid the self-detonation of the mixture. The analysis of the compression products showed that the chief process occurring in from 150 to 300° C and 250 to 400° C was the thermal decomposition of the molecules and the formation of unsaturated hydrocarbons. Branched hydrocarbons showed higher stability of the molecular structure than the normal hydrocarbons. The rate of molecule decomposition was in direct ratio to the amount of the hydroperoxides formed and the total oxidizability of the hydrocarbons. The insignificant amount of the hydrocarbon conversion (about 1%) during the 0.015 sec time of the compression cycle determines, nevertheless, the direction and character of the fuel combustion in the in the engine. There are 2 tables; and 3 references,

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2 U.S., 1 U.K., 5 Soviet. The U.S. and U.K. references are: A. Fallah, R. Long, F. Garner, Fuel, 1, 4 (1952); A. Pahnke, P. Cohen, B. Sturgis, Ind. Eng. Chem., 46, 5, 1024 (1954); G. Lappin, Anal. Chem., 23, 541 (1951).

ASSOCIATION: A. A. Zhdanov Leningrad State University (Leningradskiy gosudarstvennyy universitet imeni A. A. Zhdanova)

SUBMITTED: July 8, 1959

Card 3/3

S/152/61/000/008/001/001
B126/B101

AUTHORS: Gavrilov, B. G., Danilova, L. P.

TITLE: The problem of the composition of aromatic hydrocarbons separated from the kerosene fraction by sulfonation

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Neft' i gaz, no. 8, 1961, 93 - 98

TEXT: The authors studied the conversion of alkyl aromatic hydrocarbon blends obtained from sulfoaromatic compounds and their reaction with aluminosilicates at low temperatures. The kerosene fraction 200 - 270°C was taken as feedstock and treated with sulfuric acid. The acid tar obtained was passed through superheated steam at 160 - 170°C. After treatment with caustic soda and subsequently with strong sulfuric acid and potassium permanganate, the purified, dried product was distilled with metallic sodium; thus, aromatic hydrocarbons were obtained with the following analytical data: boiling range 158 - 250°C, n_D^{20} 1.4992, d_4^{20} 0.8903, molecular weight 145.2. Three different tests were carried out

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The problem of the...

with these hydrocarbons: 1) rectification in a column with 30 theoretical plates, 2) heating in an autoclave with a synthetic aluminosilicate catalyst up to 300°C for 10 hr, subsequent drying and rectification, 3) the same test in which the synthetic aluminosilicate was, however, replaced by gumbrin (Cenomanian bleaching clay from Georgia). The first test yielded 15 benzene homologs. The second and third tests yielded a much wider range of derivatives, i. e., benzene homologs, cyclopentanes, toluene, and xylenes (ortho, para, and meta). With the use of the synthetic aluminosilicate catalyst, about 22% aromatic hydrocarbons with a lower molecular weight were formed, and with natural clay, about 18%. This shows that the former was more efficient. Moreover, these tests showed that the hydrocarbon blend obtained after treatment of sulfuric acids with steam contained no naphthalene derivatives. Accordingly, sulfocompounds are stabler than similar compounds of the benzene range. The method described is recommended for application in laboratory tests for separation of aromatic hydrocarbons. There are 3 tables and 10 references: 8 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: Hansford R., Meyer C., Sachanen A. Ind. Eng. Chem. 37, 371, 1945; Brouton, D. Pat. USA No. 279 4839 4, 6, 1957.

Card 2/3

The problem of the...

S/152/61/000/008/001/001
B126/B101

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova
(Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: May 15, 1961

Card 3/3

GAVRILOV, B.G.; ZAVERTKIN, V.A.

Effect of lead and manganese naphthenate additions on the explosive
properties of certain hydrocarbons. Zhur.prikl.khim. 34 no.3:589-
592 Mr '61. (MIRA 14:5)
(Naphthenic acid) (Motor fuels—Antiknock and antiknock mixtures)

S/080/62/035/004/017/022
D244/D301

11.0140

AUTHORS: Bychkova, M. K., Gavrilov, B. G., Gulin, Ye. I. and
Lesnikov, A. P.

TITLE: Pre-flame conversion of hydrocarbons in diesel engines
at the critical stages of compression

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 4, 1962, 892-896 ^{Ap}

TEXT: The authors investigated pre-flame reactions in compression
ignition engines. The following fuels were used: ΓB (GV)-vacuum gas
oil, $\Delta K \Gamma$ (LKG)-light catalytic gas oil, ΔC (DS)-special diesel fuel,
 $\Gamma C-1$ (TS-1) fuel for reaction engines, $\Delta \Delta$ (DL)-summer diesel fuel,
 $\Delta M H$ (IMH)-isomethane-naphthene hydrocarbons, n -cetane, α -methyl
naphthalene, undecane and dodecane. The experiments were conducted
in a standard engine $\Delta \Gamma \Delta-3$ (IT9-3). Samples of condensed gases from
the combustion chamber were extracted into a Bunsen flask attached
to a side tube fixed to the exhaust pipe. The condensate was ana-
lyzed for unsaturated and oxygen-containing compounds of all types.
In all experiments the main pre-flame conversion process was the

(MIRA 15.4)

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Pre-flame conversion of ...

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destruction of hydrocarbon molecules under the influence of heat of compression, accompanied by the formation of unsaturated hydrocarbons. The final conversion depended on the hydrocarbon composition of the fuels and in particular on their content of normal hydrocarbons. Isomethane-naphthene hydrocarbons were converted to a much smaller extent than the normal hydrocarbons. The latter gave a large quantity of unsaturated compounds and oxidation products at relatively small degrees of compression and low temperatures. Exceptional stability was shown by α -methyl naphthalene. For the normal hydrocarbons the stability decreased with their molecular weight. For all fuels the conversion reactions took place in the gaseous phase. In the pre-flame period the degree of fuel conversion was directly proportional to its vapor pressure in the combustion chamber. There are 1 table and 13 references: 8 Soviet-bloc and 5 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: E. Retallian, M. Richerds and C. Jones, Am. Scient., 39, 656, (1951); M. Corzilius, D. Duggs and D. Pastell, S. A. E., 61 (1953); P. Garner, Fuel, 25, (1953); M. Eliot,

Card 2/3

S/080/62/035/004/017/022
D244/D301

R. Davis and R. Friedel, III World Petroleum Congress, Section VII,
(1951).

SUBMITTED: November 1, 1960

Card 3/3

X

GAVRILOV, B.G.; STEPINA, L.F.

Redistribution of methyl groups in the interaction of
naphthalene with p-xylene and mesitylene on aluminosili-
cates. Neftekhimiia 3 no.4:511-514 J1-Ag '63.

(MIRA 16:11)

1. Leningradskiy gosudarstvennyy universitet imeni Zhdanova.

GAVRILOV, B.G.; GULIN, Ye.I.; LESNIKOV, A.P.; NOVIKOVA, T.A.

Chemical principles of the thermoforcing of a diesel engine.
Zhur. prikl. khim. 36 no.11:2498-2502 N '63.
(MIRA 17:1)

GAVRILOV, B. I., and MUZHENKOVA, N. P.

"Published Information and Experimental Data on the Virus Etiology of Gastroenteritis," and "The Epidemiological Characteristics of an Unusual Outbreak of Gastroenteritis," reports discussed at one of six meetings of the Virological Section, Moscow Dept. All-Union Society of Microbiologists, Epidemiologists, and Infectionists imeni I. I. Mechnikov in 1955. Voprosy Virusologii, 1, No 2, 1956

Sum. 1003, 20 Jul 56

AFONIN, I. P.; GAVRILOV, B. I.; ZAVOYSKIY, Ye. K.; KARMANOV, F. V.;
MAKSIMOV, G. P.; PLAKHOV, A. G.; CHEREMNYKH, P. A.;
SHAPKIN, V. V.

The experimental plasma apparatus C-1 with screw magnetic
fields. Atom. energ. 14 no.2:143-150 F '63.
(MIRA 16:1)

(Plasma(Ionized gases)) (Magnetic fields)

BLINDOV, P.I.; GAVRILOV, B.I.; TAKATOV, I.P.; CHIROMNYKH, I.I.

Heating of electrons in a THz unit. 5th. v red. Zhur. eksper.
1 tsarob. fiz. 2 no.8:598-402 0 '65. (MIRA 18:12)

1. Submitted September 7, 1965.

GAVRILOV, E. I.

GAVRILOV, E. I. - "Prolonged Tapping of the Pine Tree." Sub 12 May 52,
Moscow Forestry Engineering Inst. (Dissertation for the Degree of
Doctorates in Agricultural Sciences)

SO: Vechernaya Moskva January-December 1952.

GAVRILOV, B. I.

Pine

Effect of tapping on growth. les. khoz. 5, No. 7, 1952.

9. Monthly List of Russian Accessions, Library of Congress, September ¹⁹⁵²~~1953~~. Unclassified.

GAVRILOV, B. I.

Dlitel'naia podsochka sosny v SSSR [Continuous pine-tree tapping in the U.S.S.R.].
Moskva, Goslesbumizdat, [1954?] 160 p.

SO: Monthly List of Russian Accessions, Vol. 7, No. 3, June 1954.

Gavrilov, B.I.

USSR / Forestry. Forest Economy.

K-4

Abs Jour: Biologiya, No. 1, 1958, 1348

Author : Gavrilov, B.I.

Inst : Khar'kov Agricultural Institute

Title : White Acacia Plantations and the Rules of their Structure

Orig Pub: Zap. Khar'kovsk. s.-kh. in-ta, 1955, 10 (47), 15-32

Abstract: The results are given of an evaluatory survey of white acacia plantations on the Lower Dnepr Sands and in the Moldavian SSR. The rules of distribution of the trees are characterized by sectional areas; the correlations between relative heights are explained as are the fluctuations of absolute and relative species numbers

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USSR / Forestry. Forest Economy.

"APPROVED FOR RELEASE: 08/23/2000

CIA-RDP86-00513R000514420020-3

Abs Jour: Biologiya, No. 1, 1958, 1348

Author : Gavrilov, B.I.

and of relative species heights; a dependence has been established between relative trunk sizes and their thicknesses. A close proportionality is noted between the distribution of the plantation trees according to degrees of thickness and the sum of the sectional areas. Q₂-type coefficients of the degrees of thickness change imperceptibly.

Card 2/2

USSR/FOREIGN

Abs Jour : Ref Zhur - Biol., No 15, 1958, 68016

begin to close). On the test plots the temperature regime was investigated for various heights. It was determined that intense thinning causes a rather significant increase in the temperature around the crowns, accelerating the process of photosynthesis. Soil moisture also increased significantly with increased thinning. The sharp change in the environmental conditions permitted intensification of the assimilation processes and increased inflow of moisture and salt solutions. As a result of 20 years of severe thinning, and clearing of all brushwood, the plantations grew rapidly in diameter, height, and volume, and preserved the normal trunk form and wood content. The formation of trunks was accelerated by 20 years both in volume and in quality, thus giving grounds to calculate on a 50% reduction in the time required for technical maturity. Over 27 years the total productivity of the rapid growth plantations was 63% of the productivity of the control areas; after 50 years'

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USSR/Forestry - Forest Economy.

K.

Abs Jour : Ref Zhur - Biol., No 15, 1958, 68016

growth the productivity of one of these plantations exceeded that of normal first quality plantations. The technical properties of pine wood grown in free stand conditions are close to the average, and no danger of turf formation through thinning was noticed. A detailed description is given of the method and technique of the experiments and observations. -- I.A. Bashkirov

Card 3/3

GAVRILOV, B.I.

Tapping of ripening pine trees. Gidroliz. i lesokhim.prom. 14
no.4:14-16 '61. (MIRA 14:5)

1. Khar'kovskiy sel'skokhozyaystvennyy institut imeni V. V. Dokuchayeva.
(Pine) (Turpentine)

GAVRILOV, B.I.

Establishing the tapping technology according to geographic zones.
Gidroliz. i lesokhim. prcm. 17 no.8:16-17 '64.

(MIRA 187)

L 25592-66 EWT(1)/ETC(f)/EPF(n)-2/EWG(m) IJP(c) AT

ACC NR: AT6001558

SOURCE CODE: UR/3136/65/000/907/0001/0035

AUTHOR: Blinov, P. I.; Gavrilov, B. I.; Cherenmykh, P.A.; Yashin, N. M.

65
B+1

ORG: none

TITLE: Effect of a helical field on the ohmic heating of plasma in the S-1 installation

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-907, 1965. Vliyaniye vintovogo polya na omicheskiy nagrev plazmy v ustanovke, S-1, 1-35

TOPIC TAGS: helical magnetic field, electron beam, plasma discharge, magnetic trap, plasma heating

ABSTRACT: Authors attempt to explain the role of an helical magnetic field in the development of a plasma discharge and retention of plasma in a trap, and the stabilization of the plasma filament. Based on the analysis of the first results of the experiments, a number of changes have been introduced into the S-1 installation. Additional conductors have improved the compensation of the lateral component of the magnetic field, so that the deflection of the electron beam after one turn along the axis of the chamber ($L = 617$ cm) did not exceed 1.5 mm. Thus the lateral component of a quasi-static magnetic field did not exceed 0.025%. Inside the chamber were installed two diaphragms with varying diameters from 5 to 8 cm, without disturbing the vacuum, in order to limit the discharge aperture. Additional resistance ranging from

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L 25592-66

ACC NR: AT6001558

0.05 ohm to 0.6 ohm was introduced into the ignitron circuit diagram for ohmic heating. The behavior of plasma during four basic modes of operation of the S-1 installation were compared. The discharge in all four modes of operation was studied at various circuit voltages. The voltages changed according to the cosine law in the form of rectangular impulses lasting 1 μ sec. at $E = 0.1$ v/sec and 100 μ sec at $E = 0.5$ v/cm, after which the voltage dropped again to $E = 0.1$ v/sec and gradually decreased. The authors conclude that the presence of an external helical field improves the conditions for the development of a discharge, particularly at low pressures. The electron temperature is somewhat higher. The external helical field affected slightly the electron concentration, which in the case of this work could be traced to deficiencies in the configuration of the magnetic field. Orig. art. has: 4 formulas, 20 figures, 3 tables.

SUB CODE: 20 / SUBM DATE: 00 / ORIG REF: 005 / OTH REF: 003

Card 2/2 ✓

L 41033-66 EWT(1) IJP(c) AT

ACC NR: AP6013723

SOURCE CODE: UR/0089/66/020/004/0310/0315

AUTHOR: Blinov, P. I.; Gavrilov, B. I.; Cheremnykh, P. A.; Yashin, N. M.

ORG: none

TITLE: The influence of the helical magnetic field on ohmic plasma heating in the S-1 installation

SOURCE: Atomnaya energiya, v. 20, no. 4, 1966, 310-315

TOPIC TAGS: plasma conductivity, plasma confinement, plasma heating, helical magnetic field

ABSTRACT: Ohmic plasma heating experiments showed earlier that the temperature and confinement time of the plasma depend strongly on the transverse component H_{\perp} of the magnetic field (L. A. Artsimovich, K. B. Kartashov, Dokl. AN SSSR, 146, 1305, 1962). In the present work, which was complete in 1963, the authors investigated experimentally the influence of a helical triple-thread magnetic field (with $H_{\perp} \approx 0$) on the development of the discharge, and the magnitude of the conductivity and the position stabilization of the plasma beam. Results in the form of diagrams cover the voltage and current oscillograms, the pressure dependence of the development time and maximum current, and the time dependence of plasma

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UDC: 533.9

L 41033-66

ACC NR: AP6013723

conductivity, electron concentration, and current. Plasma radiation diagrams are also given. The electron temperature of 20-30 eV and ionic temperature of 10 eV correspond to a conductivity of 10^{15} units (cgse system). The helical field improves the conditions for the development of the discharge and the heating of the plasma, while the confinement time of the plasma remains the same. Orig. art. has: 2 formulas and 6 figures.

SUB CODE: 20/ SUBM DATE: 11Sep65/ ORIG REF: 005/ OTH REF: 002

Cord 2/2 *Red*

GAVRILOV, B. I.

B. I. Gavrilov and V. E. Tishchenko, Interaction of sodium salts of thiolic acids with unsaturated α -di-bromides. II. The action of thiosulfate and ethyl-xanthogenate of sodium. p. 1637

It is shown that together with the normal exchange reaction leading to the formation of sulfides and thio ethers there proceeds an abnormal reaction with formation of ethylene hydrocarbons. In all three cases studied, the yields of products of the normal reaction decreases with an increase of molecular weight and branching of the carbon chain of the di-bromides; the yield with the abnormal reaction increases under similar condition.

Lab. of Tech. Chem., Chem. Sci. Res. Inst. at the Leningrad State Univ.
April 19, 1947

SO: Journal of General Chemistry (USSR) 28, (80) No. 9 (1948)

GABRILOV, B. L.

The yield of neutrons in the photodisintegration of uranium and thorium. L. P. Lazareva, B. L. Gabrilov, B. N. Vasiliev, G. N. Zatepina, and V. S. Slavinski. *Soviet Acad. Nauk S.S.S.R. In Minomn Tipa zovniya Atomnoy Energii, Zashchitny Otdel. Fiz.-Mat. Nauk*, 1955, 306-20 (English summary, 320-1).—The photodisintegration of U^{238} and Th^{232} was investigated with photons from a 30-m.e.v. synchrotron. For bremsstrahlung photons with E_{max} from 6 to 23 m.e.v., the yield of photoneutrons and the av. ratio $\langle E_{nec} \rangle$ of neutron to fission yield were measured. For $E_{max} = 18.5$ m.e.v., the yields of delayed neutrons accompanying the photodisintegration of U^{238} and Th^{232} were measured also. The photoneutrons passed through a paraffin moderator and were registered in a BF₃ ionization chamber. The yield of fission fragments was measured by aid of a differential parallel-plate ionization chamber. The flux of bremsstrahlung photons, impinging on the sample, was detd. by measuring the ionization inside an Al chamber with 7.5 cm. thick walls. From the obtained curves, by aid of the photon difference method, one could now calc. the photoneutron cross section curves (σ_n) and the photofission cross-section curves (σ_f) for U^{238} and Th^{232} ; the integrated cross sections for U^{238} were thus found to be 12.9 and 1.7, and for Th^{232} 6.6 and 0.84 m.e.v.-barn, resp. Analysis of the σ_n and σ_f curves makes it possible to est. the probability for U^{238} and Th^{232} fission at various energies of the γ -ray excitation. This probability is fairly const. for U^{238} with 0.2-0.3, but for Th^{232} it is about 0.1 at 8-11 m.e.v., and increases to 0.3-0.4 at higher m.e.v. For an av. excitation energy of 12 m.e.v. the yield of delayed neutrons (as % of the total neutron yield) is 0.41 ± 0.02 for U^{238} and 0.18 ± 0.01 for Th^{232} .
Werner Jacobson

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USSR/Nuclear Physics - Photofission

FD-2962

Card 1/1 Pub. 146 - 3/28

Author : Valuyev, B. N.; Gavrilov, B. I.; Zatsepina, G. N.; Lazareva, L. Ye.

Title : Average number of neutrons in one act of fission during the photo-decay of uranium and thorium

Periodical : Zhur. eksp. i teor. fiz., 29, September 1955, 280-285

Abstract : The authors measured the average number of neutrons, ν , that are found in one act of fission during the photo-decay of uranium and thorium for mean energy of excitation of the nuclei around 12 Mev. For uranium the obtained value of ν is equal to 6.2 ± 0.5 ; for thorium, it is 14.2 ± 1.2 . The measured quantities permitted the authors to evaluate the relative probability of fission during photo-decay of uranium and thorium nuclei. Seven references, all Western.

Institution : Physical Institute im. P. N. Lebedev, Academy of Sciences USSR

Submitted : May 31, 1955

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1318
AUTHOR GAVRILOV, B.I., LAZAREVA, L.E.
TITLE The Yields of Photoneutrons of Medium and Heavy Nuclei.
PERIODICAL Zhurn.eksp.i teor.fis, 30, fasc.5, 855-861 (1956)
Issued: 8 / 1956 reviewed: 9 / 1956

The yield of photoneutrons at various maximum energies of γ -bremsstrahlung from the threshold value of reaction $(\gamma, n) - E_n$ up to $E_{\max} = 27$ MeV for Cu, Zn, Cd, J, Ta, Au, Tl, Bi, Th, U was measured. These measurements were carried out with the synchrotron of the Physical Institute of the Academy of Science (for 30 MeV), which furnishes 150 γ -momenta of 20 μ sec duration each per second. The samples to be irradiated were fixed in the center of a paraffin block and the slowed down photoneutrons were registered at certain intervals of time between the γ -momenta by means of an ionization chamber filled with BF_3 . The curves obtained for the photoneutron yield are illustrated by diagrams. From the integral curves of the neutron yield it is possible to compute the cross sections of the photoneutrons σ_n for different energies of the γ -quanta. The following characteristic values of the obtained cross section curves are shown in a table: cross section $\sigma_{n \max}$ in the maximum, the energy $E_{on \max}$ corresponding to the maximum cross section, the half width of the curve, and the total cross section. The total cross sections and the cross sections in the maximum increase in a similar manner with growing $Z (\sim Z^{1,6})$. In rough approximation the total cross section, which is expressed in

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MeV barn, is connected up to 27 MeV with the maximum cross section (in barn) by

the relation $\int_{E_n}^{E_0} \sigma_n dE \sim 8\sigma_{n \max}$.

The absorption cross sections of γ -quanta: For nuclei with $Z \gg 0$ the measured photoneutron cross sections are $\sigma_n(E) \sim \sigma(\gamma, n) + 2\sigma(\gamma, 2n) +$

$+ 3\sigma(\gamma, 3n) + \dots \sim \sigma \gamma(E) \bar{n}(E)$. Here $\bar{n}(E)$ denotes the average number of neutrons emitted by the nucleus at the excitation energy E . After computation (by means of the statistical theory) of the relative probabilities (γ, n) , $(\gamma, 2n)$, ... and of $\bar{n}(E)$ at different excitation energies, the curves of the absorption cross sections $\sigma \gamma(E)$ of the γ -quanta are obtained. The relative yields of the reaction which were experimentally measured for various isotopes agree well with theoretical values. The threshold values of the photoneutronic reactions which are possible at excitation energies of up to 27 MeV are shown in a table. At energies of more than 30 MeV the cross sections $\sigma \gamma$ have a noticeable size. If the absorption of γ -quanta is based on a dipole-like mechanism, a qualitative agreement of experimental and theoretical results is obtained. The qualitative comparison makes it necessary to measure neutron yields at higher energies. This work is best carried out with monochromatization of measuring.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the USSR.

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GAVRILLOV, B. I.

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YIELDS OF PHOTONEUTRONS FROM INTERMEDIATE
AND HEAVY NUCLEI. B. I. Gavrilov and L. E. Lazarev
(Academy of Sciences, USSR). Soviet Phys. JETP 3, 871-7
(1967) Jan.

The yields of photoneutrons were measured for various
maximum γ -bremsstrahlung energies lying between the
threshold of the (γ, n) reactions up to $E_{\max} = 27$ Mev. The
photoneutron cross section was determined by the "photon
difference method" as a function of the photon energy from
the yield curves for ten elements (copper, zinc, cadmium,
iodine, tantalum, gold, thallium, bismuth, thorium and
uranium). (auth)

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21(7)

SOV/89-6-3-5/29

AUTHORS: Groshev, L. V., Gavrilov, B. I., Demidov, A. M.

TITLE: Investigation of γ -Radiation Emitted by Nuclei at Capture of Thermal Neutrons (Issledovaniye γ -luchey, ispuskayemykh yadrami pri zakhvate teplovykh neytronov)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 3, pp 281 - 289 (USSR)

ABSTRACT: The Compton- (Kompton) spectrometer used in the measurement of the γ -spectra has already been described in reference 2. The spectrometer was located in such a way opposite to the target and the neutron irradiation duct of the reactor VVR of the AS USSR, as to expose only the target to the direct neutron and γ -beam from the active zone of the reactor. The γ -radiation originating from the target was collimated over a length of 3650 mm by means of 7 lead diaphragms. The predominating weakness of the spectrometer is its unusually high γ -background, which is caused by its being placed very near to the reactor. In order to suppress this background the whole spectrometer was surrounded by a water tank and paraffin bricks, respectively, and the measuring chamber of the spectrometer was protected by a lead shield about

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Investigation of γ -Radiation Emitted by Nuclei at
Capture of Thermal Neutrons

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10 cm thick. The intensity and the energy of the γ -radiation originating from neutron capture was measured for the following nuclei: P, Sc, Cr, Cu, Zn, Sn, and Sb. The values obtained generally show a good agreement with values determined earlier. The preparations of the individual element were treated as follows: P_2O_5 was put into a bakelite box, which could be sealed hermetically. The preparation was besides inserted into an aluminum casing with a wall thickness of 1 mm. The target had a diameter of 140 mm, a length of 120 mm and a weight of 1.5 kg. Caused by the presence of the intensive capture γ -lines originating from the hydrogen, lead and aluminum in the preparation it was impossible to record the γ -spectrum of P^{32} in the range of 3.22 and >7 MeV. Sc_2O_3 . The target had a diameter of 100 mm and a weight of 25 g. The preparation was housed in a graphite container. No measurements could be conducted in the range of 2.23 and ~ 7.38 MeV due to the intensive background caused by the reaction $H(n,\gamma)D$, $Pb^{207}(n,\gamma)Pb^{208}$.

Card 2/3

Investigation of γ -Radiation Emitted by Nuclei at
Capture of Thermal Neutrons

SOV/89-6-3-5/29

Cr_2O_3 : The target had a diameter of 120 mm, a length of 10 mm and a weight of 1 kg. The γ -spectrum of the chromium isotopes 53 and 54 could not accurately be recorded in the range of 7.38 MeV.

Cu and Zn: The targets consisted of a ring with a diameter of 110 mm and a thickness of 20 mm. They weighed 1.7 and ~ 1.3 kg, respectively. The target was exposed to the incident neutron beam at an angle of 45° . The background was in the range of 7.38 MeV very weak. For this reason this region could be measured for these two elements. A. S. Volkov prepared and performed the stabilization and the measurement of the magnetic field. There are 7 figures, 4 tables, and 13 references, 5 of which are Soviet.

SUBMITTED: November 17, 1958

Card 3/3

L 45596-65 EPA(w)-2/EWT(m)/EWA(m)-2 Pab-10 DM

S/0089/65/018/003/0273/0275

ACCESSION NR: AP5009121

AUTHOR: Gavrilov, B. I.; Karmanov, F. V.; Maksimov, G. P.

TITLE: On the operation of a cylinderizer in a stellarator 19

SOURCE: Atomnaya energiya, v. 18, no. 3, 1965, 273-275

TOPIC TAGS: stellarator, magnetic field configuration, cylinderizer, magnetic trap

ABSTRACT: The authors present preliminary results of the experimental verification of one variant of a "cylinderizer" which transforms triangular magnetic surfaces in a stellarator into cylindrical surfaces. Approximate calculations for such devices were presented by E. Friman et al (The Proposed Model C Stellarator Facility, Project Matterhorn, Ch. IV, NYO-7899, p. 78). The cylinderization of helical magnetic surfaces, produced by a trifilar helical winding, was investigated by sweeping electron beams from a source of 19 beams placed in an axially-symmetrical magnetic field. The electron beams were made to follow circular paths and were displayed on a fluorescent screen after passing along the magnetic force lines through the region of the investigated helical magnetic field. The chamber and the system of coils to produce the magnetic field are described briefly. The cyl-

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L 45596-65

ACCESSION NR: AP5009121

inderizer described was found to exert too strong an influence on the magnetic surface, and cylinderization of the magnetic surfaces to acquire triangular form again. It was necessary to either reduce the current by 10% or reduce the length of the cylinderizer by 10%. Relations between the cylinderizer dimensions, the current, and the pitch of the trifilar helical winding are presented. Orig. article has: 3 figures and 2 formulas.

ASSOCIATION: None

SUBMITTED: 14May64

ENCL: 00

SUB CODE: ME

NR REF SOV: 001

OTHER: 001

Card 2/2

L 11885-66 EWT(1)/ETC(F)/EPF(n)-2/ENG(m) IJP(c) AT

ACC NR: AP5028024

SOURCE CODE: UR/0386/65/002/008/0398/0402

AUTHOR: Blinov, P. I.; Gavrilov, B. I.; Zakotov, L. P.; Cheremnykh, P. A.

ORG: none

TITLE: Electron heating in the TN-1 installation

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 8, 1965, 398-402

TOPIC TAGS: plasma heating, plasma injection, plasma electron temperature, plasma acceleration, microwave plasma/ ~~TN-1~~

ABSTRACT: The authors discuss results obtained with the TN-1 installation (Fig. 1), which was constructed to heat the electronic component of a plasma by means of a high-frequency shock circuit. The quasistatic field H_0 reached a maximum within 5 μ sec, after which it decreased with a 20 msec time constant. The mirror ratio was 2, the maximum value of the field H_0 in the center of the trap was 8 koe. The plasma was injected in the trap by a coaxial injector with electrodes made of deuterium-impregnated titanium. By varying the injector voltage it is possible to vary the plasma density from $n_e > 2 \times 10^{13} \text{ cm}^{-3}$ to $n_e < 10^{11} \text{ cm}^{-3}$. A single-turn loop with frequency $\nu = 3.5 \text{ Mc}$ at a voltage $u_c = 120 \text{ kv}$ on a capacitor $C_c = 3 \times 10^{-8} \text{ F}$ produced a field of $H = 900 \text{ oe}$. By varying the time interval between the operation of the high-frequency loop and the application of the magnetic field, it was possible to study the heating of the electrons at different H/H_0 . It was expected that the electrons with $n_e = 2 \times 10^{12} \text{ cm}^{-3}$ would be heated to $T_e = 3 \text{ kev}$, and that further adiabatic compression

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L 11885-66

ACC NR: AP5028024

would raise the temperature to ~30 kev. The experiment has shown that the cold plasma filling the trap chamber decayed as a result of recombination with a time constant $\tau_c \approx 300 \mu\text{sec}$. Not more than 10% of the high-frequency field energy goes into plasma heating, and the authors' data have so far not confirmed the conclusion that turbulent heating of a plasma by means of a shock circuit is highly effective. The x-rays of energy ~20 kev emitted from the chamber after the closing of the circuit are due to the presence of an accelerating mechanism and do not prove the existence of high electron temperatures. Authors thank Ye. K. Za-

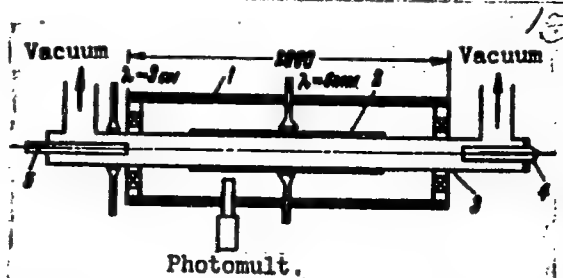


Fig. 1. Diagram of TN-1 installation. 1 - Solenoid, 2 - high-frequency shock circuit, 3 - vacuum glass chamber, 4 - plasma injector, 5 - grid probe or x-ray detector.

voyskiy for suggesting the topic and interest in the work, and L. I. Rudakov, G. V. Sholin, A. V. Gordeyev, and L. V. Korablyev for useful discussions. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 07sep65/ ORIG REF: 007

Card 2/2

L 20386-66 EWT(1)/ETC(f)/EPF(n)-2/ETC(m) IJP(c) AT

ACC NR: AT6001561

SOURCE CODE: UR/3136/65/000/912/0001/0008

AUTHOR: Blinov, P. I.; Gavrilov, B. I.; Zakatov, L. P.; Cheremnykh, P. A. ⁶⁸₅₈ORG: Institute of Atomic Energy im. I. V. Kurchatov (Institut atomnoy energii) ⁶⁸₅₈TITLE: Heating of electrons in the TN-1 installation

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-912, 1965. Nagrev elektronov v ustanovke TN-1, 1-8

TOPIC TAGS: plasma heating, electron temperature, plasma injection, magnetohydrodynamics, plasma wave propagation, plasma discharge, x ray emission/ TN 1

ABSTRACT: The authors describe apparatus TN-1 (Fig. 1), designed for heating the electronic component of a plasma by means of a high frequency shock circuit. The quasistatic field reached a maximum within 5.0 msec, after which it dropped off with a time constant of 20 msec. The mirror ratio was 2, and the maximum field in the center of the trap was 8 koe. A single-turn loop with frequency 3.5 Mcs with a discharge of 3×10^{-8} F capacitor at a voltage of 120 kv, produced a field of 900 oe. The plasma was injected in traps by means of a coaxial injector. The plasma density could be varied from 2×10^{13} to 10^{11} cm⁻³ by varying the injector voltage. The heating was investigated in the electron density region 10^{12} -- 10^{13} cm⁻³. The tests have shown that a radial magnetohydrodynamic wave propagated in

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L 20386-66

ACC NR: AT6001561

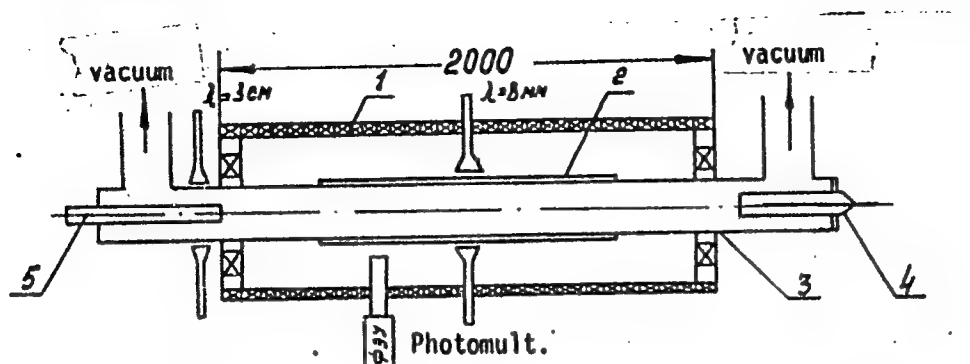


Fig. 1. Diagram of TN-1 installation. 1 - Solenoid, 2 - high frequency shock circuit, 3 - vacuum glass chamber, 4 - plasma injector, 5 - grid probe or end-window x-ray detector.

the plasma, and that the wave front becomes steeper upon heating. The electron distribution function relative to the longitudinal energy disclose the presence of two groups of electrons, a main group with average energy 100--250 ev, and a

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ACC NR: AT6001561

5
secondary group (25%) with energy of the order of 1 kev. Discharge of the plasma filled with the aid of the injector gave rise to emission of x-rays of energy 20 kev from the chamber, the x-radiation lasting as much as 25 msec. These x-rays are shown to be the result of the acceleration mechanism in the plasma. The authors thank Ye. K. Zavoyzskiy for suggesting the topic and interest in the work, and L. I. Rudakov, L. V. Korablev, G. V. Sholin, and A. V. Gordeyev for useful discussions. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 006/ OTH REF: 001

Card 3/3 7/75

GAVRILOV, B. K.

"Application of Mechanical Rectifiers in Synchronous Motors of Normal Design."
Cand Tech Sci, Ural Polytechnic Inst imeni S. M. Kirov, Min Higher Education USSR,
Sverdlovsk, 1954. (KL, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational
Institutions (12)

SO: SUM No. 556, 24 Jun 55

AUTHORS: Siunov, N. S., Professor, Doctor of SOV/105-58-8-9/21
Technical Sciences, Gavrilov, B. K., Candidate of Technical
Sciences, Breyev, V. N., Candidate of Technical Sciences

TITLE: Excitation of a Synchronous Motor of Normal Construction With
the Application of Mechanical Rectifiers (Vozbuzhdeniye
sinkhronnykh dvigateley normal'noy konstruktsii s primeneniye
mekhanicheskikh vypryamiteley)

PERIODICAL: Elektrichestvo, 1958, Nr 8, pp. 46-49 (USSR)

ABSTRACT: The problem of the spark-free commutation of mechanical
rectifiers was solved best by S. G. Tamantsev (Ref 1). In
the scheme proposed by him the mechanical rectifier is fed by
a supplementary winding fitted in the slots of the stator of
the generator. The experiments by S. G. Artanov (Ref 2) showed,
that this scheme guarantees a spark-free commutation in con-
tinuous operation only at a constant load. A circuit is
described which guarantees a satisfactory commutation also at
shock load. For this purpose a transformer with three windings
is employed, which feeds the circuit of the exciter winding
of the synchronous motor across a mechanical rectifier. The
synchronous motor has a normal design and needs no additional

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Excitation of a Synchronous Motor of Normal Construction SOV/105-50-8-9/21
With the Application of Mechanical Rectifiers

winding in the stator. The circuit diagram is described. Subsequently the operation of the transformer in a circuit with the three-winding adjustable transformer is investigated. It is shown, that a sufficient resistance of the brush contact, a small equivalent inductivity of the transformer equipment and an accurately determined position of the brush holder must be guaranteed in order to ensure a satisfactory performance of the mechanical rectifier. In connection with the experimental investigation of the synchronous motor with a mechanical rectifier its performance was examined at a continuous and at a sudden change of load. The numerous results showed a satisfactory commutation of current in the whole range of motor load. The motor operates stably and with a practically spark-free commutation at a sudden change of load from zero to 70% of nominal load. As a summary it is stated: The excitation of synchronous motors of normal design of small and medium power can be performed by means of a mechanical rectifier. The rectifier is connected to the output side of a three-phase transformer with three windings and a controllable magnetic shunt. 2) The circuit described guarantees an auto-

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Excitation of a Synchronous Motor of Normal Construction SOV/105-58-8-9/21
With the Application of Mechanical Rectifiers

matic increase of exciter current with an increase of load in the motor. 3) The commutation of the mechanical rectifier is satisfactory at a slow as well as at a sudden change of load. There are 7 figures and 3 references, all of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. Kirova (Ural Polytechnical Institute imeni Kirov)

SUBMITTED: March 4, 1958

1. Electric motors--Design
2. Motor generators--Application
3. Electric circuits--Test results
4. Transformers--Performance

Card 3/3

BREYEV, V.N., kand. tekhn. nauk; GAVRILOV, B.K., kand. tekhn. nauk

Mechanical rectifier in the excitation circuit of synchronous
machinery. Trudy Ural. politekh. inst. no.90:5-20 '58.

(MIRA 13:2)

(Electric generators--Design and construction)
(Electric current rectifiers)

GAVRILOV, B.K., kand. tekhn. nauk

Static characteristics of synchronous motors with a regulating
transformer and mechanical rectifier in the excitation circuit.
Trudy Ural. politekh. inst. no.90:21-27 '58. (MIRA 13:2)
(Electric motors, Synchronous)

88170


S/144/60/000/010/007/010
E194/E355

9.3250 (1020,1143,1154)

AUTHORS: Siunov, N.S., Doctor of Technical Sciences, Professor,
Departmental Head, ~~Gavrilov, B.K.~~, Candidate of
Technical Sciences, Senior Lecturer and
Kovylov, B.V., Assistant

TITLE: The Influence of Capacitance on the Operation of a
Mechanical Rectifier

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,
Elektromekhanika, 1960, No. 10, pp. 93 - 97

TEXT: Current commutation by a mechanical rectifier in the
field circuit of a synchronous motor may be improved by
shunting the rectifier brushes by ohmic resistance. However,
such resistances lower the efficiency of the rectifier. 
Better and more efficient commutation may be obtained by using
additional capacitances instead of the shunt resistances. In
view of the previous article by some of the present authors,
published in this journal, 1959, No. 6, the operation of
mechanical rectifiers is now considered and the conditions
necessary to obtain sparkless commutation are established.
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S/144/60/000/010/007/010
E194/E355

The Influence of Capacitance on the Operation of a Mechanical Rectifier

Fig. 1 shows a circuit of a single-phase mechanical two-plate rectifier with supply transformer. The differential equation for the concluding stage of commutation is given and analysis of its solution makes it possible to establish a physical picture of the processes during current commutation. Near the point where the voltage of the supply to the rectifier passes through zero there is a certain current when the transformer and load circuit are interrupted. As both transformer and load have appreciable inductance, a charging current passes into the capacitor. Later the capacitance discharges, partially through the transformer winding and partially through the load. The process of discharge may be periodic or aperiodic. Since the natural capacitance of the transformer is small, considerable over-voltages are set up in the process of current switching, their peak values reach 200 - 230 V. These over-voltages can cause severe sparking at the brushes. As the

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E194/E355

The Influence of Capacitance on the Operation of a Mechanical Rectifier

capacitance is increased the over-voltage is reduced, and the duration of the concluding stage of commutation extends because the frequency of voltage restoration falls. Restoration of the voltage follows a sinusoidal law. The amplitude is exponentially damped and is superimposed on the sinusoidal supply voltage. As the capacitance is increased to a value of $4 L/r^2$, the periodic law of voltage restoration becomes aperiodic, so improving the electromagnetic conditions of current commutation. The rectifier ceases to spark over a wide range of change of load. All this is illustrated by the oscillograms of Fig. 2. Operation of a three-phase mechanical rectifier is then considered. The principles of this machine have been described elsewhere and are not enumerated, here. The influence of capacitance on the current commutation of a three-phase mechanical rectifier was studied with the circuit

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S/144/60/000/010/007/010
E194/E355

The Influence of Capacitance on the Operation of a Mechanical Rectifier

shown schematically in Fig. 3. The tests were made with purely resistive and also with mixed inductive loads. This second type of load is the most difficult to provide for and so the results given below relate to it. Fig. 4 shows oscillograms of rectified voltage and current (a) with a capacitance of 1 036 μ F and (b) with a resistance of 3.3 ohm and no capacitance. ✓

It will be seen that the over-voltage peaks typical of mechanical rectifiers without shunt resistances are absent from both these curves. When shunt resistance is used there is an appreciable fall in the efficiency of the rectifier, whereas with shunt capacitance the efficiency is 97%. Fig. 5 shows oscillograms of rectified current and voltage (a) with shunt capacitance and (b) with shunt resistance. The rectification coefficient is 10 - 15% higher with capacitance than with resistance. The article concludes with Card 4/5

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S/144/60/000/010/007/010
E194/E355

The Influence of Capacitance on the Operation of a Mechanical Rectifier

instructions for adjusting the rectifier to secure optimum operating conditions. There are 5 figures and 4 Soviet references.

ASSOCIATION: Kafedra elektricheskikh mashin Ural'skogo politekhnicheskogo instituta (Department of Electrical Machines, Ural Polytechnical Institute)

SUBMITTED: January 20, 1960

Card 5/5

GAVRILOV, B.K., inzh.

Accuracy of determining the volume of overburden by transit.
survey data. *Izv. yys. ucheb. zav.; gor. zhur. no. 11:101-110*
'60. (MIRA 13:12)

1. Sverdlovskiy goranyy institut imeni V.V. Vakhrusheva.
Rekomendovana kafedroy marksheyderskogo dela Sverdlovskogo
gornogo instituta.
(Mine surveying)

SIUNOV, Nikolay Sergeyevich, doktor tekhn.nauk, prof.; GAVRILOV, Boris Konstantinovich, kand.tekhn.nauk, starshiy prepodavatel' KOVYLOV, Boris Vladimirovich, assistant

Effect of capacitance on the performance of a mechanical rectifier.
Izv. vys. ucheb. zav.; elektromekh. 3 no.10:93-97 '60.

(MIRA 14:4)

1. Zaveduyushchiy kafedroy elektricheskikh mashin Ural'skogo politekhnicheskogo instituta (for Siunov). 2. Ural'skiy politekhnicheskii institut (for Gavrilov). 3. Kafedra elektricheskikh mashin Ural'skogo politekhnicheskogo instituta (for Kovylov).

(Rotary converter)

S/196/61/000/009/030/052
E194/E155

AUTHORS: Siunov, N.S., Gavrilov, B.K., and Kovylov, B.V.
TITLE: A synchronous motor with mechanical rectifier
shunted by capacitance
PERIODICAL: Referativnyy zhurnal, Elektrotehnika i energetika,
no.9, 1961, 23, abstract 9I 155. (Vestn. elektroprom-
sti, no.2, 1961, 45-48)

TEXT: The commutation of the mechanical rectifier of a
machine field system was investigated. The supply was from a
three-winding transformer controlled by a magnetic shunt. The
alternating current side of the mechanical rectifier was shunted
by capacitors connected in delta. The single-phase current
rectification conditions are considered. The physical processes
that take place in mechanical rectifiers are explained and the
value of capacitance required to ensure sparkless commutation is
selected. It is established that the transformer circuit of the
mechanical rectifier should contain the following ohmic resistance:

$$r_k = 2 \sqrt{L/C}$$

Card 1/2

A synchronous motor with ...

S/196/61/000/009/030/052
E194/E155

It would not be rational to increase the transformer resistance, because of the consequent lower efficiency, and so the necessary conditions can be achieved by connecting shunt capacitance C across the rectifier input. The additional capacitance reduces the amplitude, frequency and rate of voltage restoration, thus extending the sparkless zone to angular differences of up to 30 electrical degrees. Shunting resistors selected to give maximum efficiency give sparkless commutation in the zone up to 10 electrical degrees when the rectifier operates with a transformer without compounding winding. The greatest width of the sparkless zone achieved by the use of input capacitance across the rectifier, and the possibility of maintaining the angular difference at the lowest levels, together ensure sparkless operation of the rectifier over all ranges of motor load under static and dynamic conditions. A motor with the suggested field circuit has greater static and dynamic stability than motors with machine excitation, and the efficiency of a mechanical rectifier, allowing for the additional capacitors, is 96-97%. 5 illustrations.

[Abstractor's note: Complete translation.]

Card 2/2

ANTIPOV, M.F.; GAVRILOV, B.K.; MILAYKIN, I.F.; PAVLININ, V.M.; REZIN, M.G.

"DC machinery design" by IA.S. Gurin and M.N. Kurochkin.

Reviewed by M.F. Antipov and others. Elektrichestvo no.3:95-96

Mr '62.

(MIRA 15:2)

(Electricity machinery--Direct current)

(Gurin, IA.S.)

(Kurochkin, M.N.)

KOVYLOV, B.V.; GAVRILOV, B.K.; PLASTUN, A.T.

Single-phase mechanical rectifier with capacitance in the
excitation circuit of the synchronous motor. Trudy Ural.
politekh. inst. no.124:16-24 '62. (MIRA 16:8)

CHUGAY, A.D.; LADIYEV, R. Ya.; GAVRILOV, B.M.; LOBURENKO, A.I.; SHUGUROV, V.S.

Processes for the manufacture of rubber adhesives and their automatic control. Kauch. i rez. 20 no.6:41-45 Je '61. (MIRA 14:6)

1. Kiyevskiy zavod "Krasnyy rszinschik" i Institut avtomatiki Gosplana USSR.

(Rubber)
(Adhesives)
(Automatic control)

GAVRILOV, B. M.[Havrylov, B. M.]

Some types of quality control instruments manufactured by firms
in France. Khim. prom.[Ukr.] no.1:91-94 Ja-Mr '62.
(MIRA 15:10)

1. Institut avtomatiki Gosplana UkrSSR.

(Chemical industries--Quality control)
(France--Scientific apparatus and instruments)

LADIYEV, R.Ya.; GAVRILOV, B.M.; SHUGUROV, V.S.; LOBURENKO, A.I.

Automation of the operations of the benzene retrieving system.
Kaukh.i rez. 21 no.8:45-47 Ag '62. (MIRA 16:5)

1. Institut avtomatiki Gosplana UkrSSR.
(Rubber industry—Equipment and supplies)
(Automatic control)
(Benzene)

Q-8

USSR/Farm Animals - Honey Bees.

Abs Jour : Ref Zhur - Biol., No 1, 1958, 2679

Author : B.N. Gavrilov

Inst : -

Title : The Use of Acetic Acid Against the Nosema Disease of Bees.

Orig Pub : Pchelovodstvo, 1957, No 4, 47-50

Abstract : Laboratory experiments at the Leningrad Veterinary Institute demonstrated that nosema spores found in the fecal discharge of bees when exposed to the vapors of glacial acetic acid at a temperature of 18-20° died after 7 days. The same effect was obtained in the course of one hour when the spores were exposed to the vapors of a 30 percent solution and a temperature of 53-54°. After disinfection the bee hives were aired, and were readily accepted by bees.

Card 1/1

USSR / Farm Animals. Honeybee.

Q-5

Abs Jour: Ref Zhur-Biol., No 23, 1958, 105738.

Author : Gavrilov, B. N.

Inst : Leningrad Veterinary Institute.

Title : On the Treatment of Nosematosis of Honeybees.

Orig Pub: Sb. rabot Leningr. Vet. in-t, 1957, vyp.20, 181-190.

Abstract: Experiments in the treatment of honeybees, in cages placed in a thermostat at a temperature of 32-33°, with penicillin (500,000 international units per 1 liter of sugar syrup) and with biomyacin (250 and 500 mg. per 1 liter of feed) were ineffective. Likewise, no positive results were obtained in the industrial experiments carried out on small colonies. Satisfactory results were obtained with the use of fumidil B (250 mg./.).

Card 1/2

GAVRILOV, B. N.: Master Biol Sci (diss) -- "Therapeutic and prophylactic measures in nosematoses of bees". Leningrad, 1959. 22 pp (Min Agric USSR, Leningrad Vet Inst), 150 copies (KL, No 17, 1959, 107)

NIKIFOROVA, V.D.; GAVRILOV, B.P.

Permian and Triassic sediments in the western Verkhoyansk Range.
Trudy VNIGRI no. 130:125-157 '59. (MIRA 14:4)
(Verkhoyansk Range—Geology, Stratigraphic)

GAVRILOV, B. YE..

95

S/089/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inzhenerno-fizicheskogo
instituta (Scientific Conference of the Moscow Engineering
Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 603 - 606

TEXT: The annual conference took place in May 1962 with more than 400 delegates participating. A review is given of these lectures that are assumed to be of interest for the readers of Atomnaya energiya. They are following: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev, design of accelerators for superhigh energies; I. Ya. Pomeranchuk, analyticity, unitarity, and asymptotic behavior of strong interactions at high energies; A. B. Migdal, phenomenological theory for the many-body problem; Yu. D. Fivyskiy, deceleration of medium-energy antiprotons in matter; Yu. M. Kogan, Ya. A. Iosilevskiy, theory of the Mössbauer effect; M. I. Ryzanov, theory of ionisation losses in nonhomogeneous medium; Yu. B. Ivanov, A. A. Rukhadse, h-f conductivity of subcritical plasma;

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36

S/089/62/013/006/019/027
B102/B186

Nauchnaya konferentsiya...

Ye. Ye. Lovetskiy, A. A. Rukhadze, electromagnetic waves in nonhomogeneous plasma; Yu. D. Kotov, I. L. Rosental', the origin of fast cosmic muons; Yu. M. Ivanov, muon depolarization in solids; V. G. Varlamov, Yu. M. Grashin, B. A. Dolgoshein, V. G. Kirillov-Ugryumov, V. S. Roganov, A. V. Samoylov, μ^- capture by various nuclei; V. S. Deaidov, V. G. Kirillov-Ugryumov, A. K. Ponomov, V. P. Protasov, F. M. Sergeyev, scattering of π^- mesons at 5 - 15 Mev in a propane bubble chamber; S. Ya. Nikitin, M. S. Aynutdinov, Ya. M. Selektor, S. M. Zombkovskiy, A. F. Grashin, muon production in π^+p interactions; B. A. Dolgoshein, spark chambers; N. G. Volkov, V. K. Lyapidevskiy, I. M. Obodovskiy, study of operation of a convection chamber; K. G. Pinogov, production of square voltage pulses of high amplitudes; G. M. Alekseev, problems of color vision; V. K. Lyapidevskiy, relation between number of receivers and number of independent colors; Ye. M. Kudryavtsev, M. M. Sobolev, M. I. Tisengauzen, L. M. Tunitkiy, F. S. Paysulov, determination of the moment of electron transition of oscillator for O_2 and the widths of the Schumann-Runge bands of molecular oxygen; S. Ye. Gavrilov, A. V. Zharikov, V. I. Bayko, decomposition of the volume charge of intense ion beams; Ye. A. Kramer-Ageyev, V. S. Troshin, measurement of neutron spectra; G. G. Doroshenko, new methods of fast-neutron recording; V. I. Ivanov, dosimetry terminology; A. M. Voronkov, Card 2/4.

L 1931-66 EWT(m)/EPF(c)/ETC/EPF(n)-2/EWG(m)/EWP(b)
ACCESSION NR: AT5022583 UR/3136/64/000/692/0001/0020

AUTHOR: Gavrilov, B. Ye.; Zharinov, A. V.; Rayko, V. I.

TITLE: Dynamic decompensation of the space charge of ion beams in electromagnetic isotope separation 19

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-592, 1964. O dinamicheskoy dekompensatsii prostranstvennogo zaryada ionnykh puchkov pri elektromagnitnom razdelenii izotopov, 1-20

TOPIC TAGS: ion beam, plasma density, plasma oscillation, space charge, gas discharge plasma

ABSTRACT: An attempt is made at an elementary theoretical generalization of certain properties of intense ion beams, primarily for the purpose of finding possible methods of controlling dynamic decompensation. It is shown that the geometrical properties of beams extracted from plasma obey the laws of similarity. On the basis of these laws, general relationships are established which correlate the plasma density pulsations in the source, the angular divergence, the degree of dynamic decompensation, and the beam potential. The elementary theoretical analysis used shows that the regimes most favorable from the standpoint of dynamic decompensation of ion beams are those corresponding to divergent beams. Under these conditions, the degree of dynamic decompensation is minimal and is Card 1/2

L 1931-66

ACCESSION NR: AP5022583

the same in order of magnitude as the relative pulsation of plasma density in the discharge. Therefore, since it is always possible to select regimes where the pulsations of angular divergence become unimportant, a further increase in the intensity of compensated ion beams will require the development of methods for substantially decreasing the level of current density pulsations in the discharge. Orig. art. has: 8 figures, 19 formulas, and 1 table.

ASSOCIATION: None

SUBMITTED: 00

ENCL: 00

SUB CODE: ME, EM

NO REF SOV: 003

OTHER: 001

Card *mlr*
2/2

GAVRILOV, D.

~~Central warehouse of a department store in Belgium. Sov. org.~~
no. 4:54-57 Ap '57. (MLRA 10:4)
(Belgium--Warehouses)

SOV/84-58-11-39/58

AUTHORS: Zenin, S., Gavrilov, D.

TITLE: Pilot Tsyganov's Error (Oshibka pilota Tsyganova)

PERIODICAL: Grazhdanskaya aviatsiya, 1958, Nr 11, pp 30-32 (USSR)

ABSTRACT: The editors requested the authors to analyze the error committed by pilot Tsyganov (Urals aviation group) while flying under difficult weather conditions. The article describes the particular situation and attributes the pilot's accident to inexperience in instrument flying and generally inadequate training, primarily responsible for his fatal decision to drop to a minimal altitude in search of a landing. The need for careful preliminary study of meteorological conditions is stressed and the importance of following the written instructions given all pilots which cover various situations and emergencies. The authors point to the difference between piloting transport planes and planes used for special purposes, the latter usually flown along local routes where guidance from the ground may not be

Card 1/2

Pilot Tsyganov's Error

SOV/84-58-11-39/58

depended upon. Personalities mentioned include pilot Lobutenkov (Northern Territorial Administration), and An-2 commander Smolyakov (Northern Caucasus Territorial Administration).

Card 2/2

CHERNYAK, N.I. [Cherniak, M.I.]; GAVRILOV, D.A. [Havrylov, D.O.];
MANDEL', V.S.

Effect of metallurgical defects on the strength of 3Kh13 steel.
Prykl. mekh. 10 no.4:407-415 '64. (MIRA 17:10)

1. Institut mekhaniki AN UkrSSR.

POKROVSKIY, Aleksandr Nikolayevich; BUKIN, Aleksandr Alekseyevich; GAV-
RILOV, Dmitriy Fedorovich; TOLKACHEV, S.S., retsenzent; GONCHA-
RUK, Yu.K., red.; STRYZHKOVA, N.I., red. izd-va; NIKOLAYEVA,
L.N., tekhn. red.

[Operating motortrucks with carburetor engines under low temperature
conditions] Ekspluatatsiia avtomobilei s karbiuratornymi dvigatelemi
v usloviakh nizkikh temperatur. Moskva, nauchno-tekhn. izd-vo M-va
avtomobil'nogo transp. i shosseinykh dorog RSFSR, 1961. 171 p.
(MIRA 14:10)

(Motortrucks—Cold weather operation)

166T89

GAVRILOV, D. V.

USSR/Mining - Gas Analysis

Jul 50

"Portable Gas Interferometer," D. V. Gavrilov

"Zavod Lab" Vol XVI, No 7, pp 836-842

Describes portable apparatus for determination of methane content in the air of mines. It may be calibrated also for determining concentrations of other gases, such as SO_2 , H_2S , CO_2 , hydrogen, gasoline, and others. Accuracy of measuring concentrations of these gases in the air depends on difference of refractive indexes of gases to be compared and reaches 0.01% in some cases, e.g., in determination of carbon bisulfide content.

166T89

GAVRILOV, D.V.

Computation of an ordinary lens with a single reflecting
surface. Opt. i spektr. 13 no.3:436-441 S '62. (MIRA 15:9)
(Lenses)

GAVRILOV, D. V.

USSR/Miscellaneous

Card 1/1 : Pub. 104 - 10/14

Authors : Gavrilov, D. V., and Vil'chur, Ya. P.

Title : Rapid method of determining small differences in glass refraction indexes

Periodical : Stek. i ker. 10, 22-24, Oct 1954

Abstract : A new method for rapid determination of small differences in the index of refraction of optical glass is described. The method, developed by one of the authors (D. V. Gavrilov), is based on the disappearance of the visible boundaries of the glass submerged in a liquid at the moment the index of refraction becomes equalized. Tables; graph.

Institution : ...

Submitted : ...

GAVRILOV, D.V.

Relationship between basic parameters of an infinitely thin component
and its aberrations of the third order. Opt.-mekh.prom. 25 no.4:9-10
Ap '58. (MIRA 11:10)

(Optical instruments)

ANANOVA, L.; GAVRILOV, E.

Patent purity of export production. Vnesh.torg. 43 no.4:49-51 '63.
(Patents (International law)) (MIRA 16:4)

GAVRILOV, E.I.

Recent data on birds of western Kazakhstan. Trudy Inst. zool.
AN Kazakh. SSR 15:46-49 '61. (MIRA 14:7)
(West Kazakhstan Province--Birds)

GAVRILOV, E.I.

Biology of the desert finch *Rhodospiza obsoleta* Licht. Trudy
Inst. zool. AN Kazakh. SSR 15:182-183 1961. (MIRA 14:7)
(Nikolayevka region (Alma-Ata Province)—Finches)

GAVRILOV, E.I.; ZALESKIY, A.N.

Feeding of the falcons *Falco tinnunculus* L. and *F. vespertinus* L.
in the forest-steppe part of the Central Black Earth Region.
Zool. zhur. 40 no.6:882-887 Je '61. (MIRA 14:6)

1. State University of Voronezh.
(Gremyach'ye District—Falcons)
(Birds—Food)

FEDOSENKO, A.K.; GAVRILOV, E.I.

Effect of the peculiarities of spring on the behavior of birds.
Biul. MOIP, Otd. biol. 67 no.1:121-122 Ja-F '62. (MIRA 15:3)
(BIRDS--BEHAVIOR)

GOLOVANOVA, E.N., kand.biolog.nauk; ZUSHANOVICH, T.G.; GAVRILOV, S.I.

Poisoned grain baits against sparrows. Zashch. rast. ot vred.
i bol. 6 no.3:34-35 Mr '61. (MIRA 15:6)

1. Kazakhskiy institut zashchity rasteniy, Alma-Ata (for Gavrilov).
(Soviet Central Asia--Sparrows--Extermination)

GAVRILOV, E.I.

Extermination of sparrows with poisoned baits in Kazakhstan.
Ornitologiya no.5:314-319 '62. (MIRA 16:2)
(Kazakhstan--Sparrows--Extermination)

GAVRILOV, E.I., kand. biolog. nauk; SHUTKIN, P.A.

Is the "sparrow" problem definitely solved? Zashch. rast. ot vred.
i bol. 9 no.9:7-8 '64. (MIRA 17:11)

1. Kazakhskiy Institut zashchity rasteniy i Dzhambul'skaya stantsiya
zashchity rasteniy.

PODBOLOTOV, A. (Kolonna); GAVRILOV, F. (Kolonna)

The workers' **collective** in the role of educator. Mest.prom. 1
khud.promys. 2 no.12:4 D '61. (MIRA 14:12)
(Communist Party of the Soviet Union—Party work)

CA

3

Thermal quenching of photoluminescence of zinc oxide.
 F. I. Vergunov and F. F. Gavrilov (Tomsk State Univ.),
Doklady Akad. Nauk S.S.S.R. **57**, 31-4 (1947); cf. C.A.
 42, 6243i. --ZnO with green photoluminescence, in which the
 content of free Zn was varied by heating in air to 600-700°,
 was examined. The curve of intensity of luminescence against
 temp. is S-shaped with a rapid decline between 250 and
 400 K. As intensity of exciting light is reduced, the magni-
 tude of U (activation energy) remains const., but C (the
 ratio of ionic vibration frequency to the probability of emis-
 sion) increases. ZnO heated in air displays increase of C
 with reduction of the content of free Zn atoms, but U re-
 mains const. Hence the electron transfer occurs from the
 Zn atom level to the conduction zone, which leads to quenching of
 luminescence of ZnO.

(G. M. Korolapov)

GAVRILOV, F. F.

Vergunas, F. I. and Gavrilov, F. F. "The relative amount of the spontaneous afterglow of zinc oxide," Trudy Sib. fiz.- tekhn. in-ta, Issue 26, 1948, p. 140-45, - Bibliog: 6 items

SO: U-5241, 17 December 1953, (Letonis'Zhurnal 'nykh Statey, No. 26, 1949)

GAVRILOV, F. F.

Vergunas, F. I. and Gavrilov, F. F. "Infrared luminescence of zinc oxide,"
Trudy Sib. Fiz.-tekh. in-ta, Issue, 1949, p. 146-47

SO: U-5241, 17 December 1953, (Letonis 'Zhurnal 'nykh Statey, No. 26, 1949)

GAVRILOV, F. F.

Vergunas, F. I. and Gavrilov, F. F. "The action of the blue band
of Zn in phosphorous ZnSmN with variable Mn concentration,"
Trudy Sib. fiz.-tekhn. in-ta, issue 26, 1949, p. 142-44

SO: U-5241, 17 December 1953, (Leto is 'Zhurnal 'nykh Statey, No.26, 1949)

1ST AND 2ND CODES		PROCESS AND PROPERTIES INDEX		3RD AND 4TH CODES	
<p>Luminescence spectra of zinc oxide. F. I. Vergunas and F. F. Gavrilov (Siberian Phys. Tech. Inst., Tomsk Univ.), <i>J. Exptl. Theoret. Phys. (U.S.S.R.)</i> 18, 224-7 (1948) (in Russian).—Both at room temp. and at -180°, ZnO shows the same luminescence spectrum, with one single max. at 480 mμ, whether untreated or previously heated to 300° and 600°. Previous heating to 630° gives rise to 2 new bands with max. at about 525 and 560 mμ; after heating to 730°, a 4th band with max. at 670 mμ appears. The addnl. bands are marked at -180° but are of negligible intensity, as compared with 480 mμ, at room temp. For ZnO heated at 700°, visual brightness at room temp. is max. at 525 mμ, at -180°, at 560 mμ. Such samples luminesce with a golden-yellow color at the temp. of liquid air, lettuce-green at room temp. The authors' (<i>Doklady</i> 57, 31 (1947)) formula for the temp. extinction of the intensity of luminescence $I = I_0 / (1 + C e^{-U/L})$, where C = const., L = distance between the levels of Zn atoms and the cond. zone, will apply to the extinction of this sample, if the L value characteristic of the 560 mμ band is used at low temp., and that corresponding to 525 mμ, at room temp. From the temp. dependence of the 4 bands of ZnO, the 4 values of L are 0.36, 0.5, 0.6, and 0.8 v. Elec. cond. (in the dark) of ZnO subjected to various thermal treatments, gives (<i>Vys. Tverd. Sibirskogo Fiz.-Tekh. Inst.</i> 24, 184 (1947)) 5 levels, $L = 0.4, 0.5, 0.6, 0.8$, and 1.0. If every local level gives rise to a luminescence band, ZnO should have a 5th band at about 770 mμ; which, however, has not yet been observed. Emission and absorption spectra give the 4 values of L give 0.6, 0.8, 1.0, and 1.2, that is higher than those derived from both the temp. extinction of luminescence and from the dark cond.</p> <p style="text-align: right;">N. Thon</p>					
<p>ASB-51A METALLURGICAL LITERATURE CLASSIFICATION</p>					
<p>1ST AND 2ND CODES</p>					
<p>3RD AND 4TH CODES</p>					

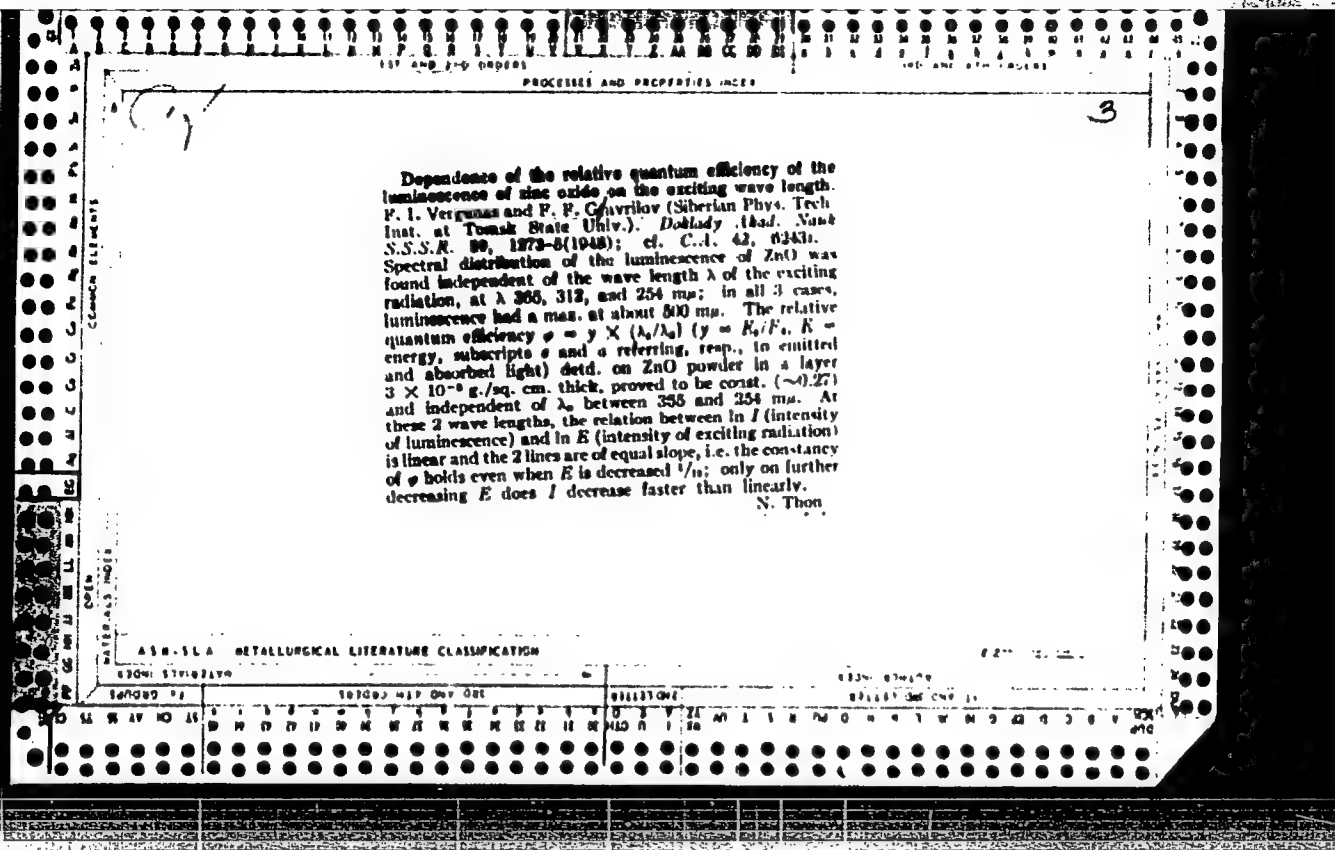
DEPENDENCE OF THE INTENSITY OF LUMINESCENCE OF ZINC OXIDE AND ZINC SULFIDE ON THE INTENSITY OF THE EXCITATION.

P. I. Vergunov and P. P. Gavrilov. *Zhur. Eksp. Teor. Fiz.* (J. Exptl. Theoret. Phys.) 18, 873-7 (1948); cf. C.A.B. 42, 7161a. —Temp. quenching of the intensity I of luminescence of ZnO is represented very accurately by $I = I_0 / (1 + C e^{-U/kT})$, with the activation energy for nonradiative transition, $U = 0.18$ e.v.; I_0 is the satn. intensity at low temps. where the exponential term is negligible, and the coeff. C is a function of the intensity of excitation E . Weakening of E by a factor $1/11.4$ resulted in 1.09 fold increase of C . If the change of C with E is represented by $C = C_0 E^{-s}$, where the subscript s refers to the weakened excitation, one has, for ZnO, $s = 0.25$, and the law of variation of I is $I = E_0 (1 + C_0 E^{-s}) / [1 + (C_0/E_0) e^{-U/kT}]$. It permits calcn. of the $I(E)$ curve for any given temp., and is confirmed for ZnO at -180° and at $+25^\circ$, the exptl. point lying exactly on the lines $\log I(\log E)$; at high E , the lines converge and practically merge. At -180° , the line is straight, at $+25^\circ$ it deviates from linearity, becoming slightly concave to the axis of abscissas. Luminescence of ZnS.Zn (pure ZnS), filtered so as to transmit 440-490 m μ and to absorb the emission due to the Cu impurity (2% of the total emission), follows the same law, with $U = 0.47$ e.v., $s = 0.5$. Plots of $\log I$ against $\log E$, showing complete agreement of the exptl. points with the calcd. curves, are rectilinear at -83° but deviate from linearity at $+21$ and 44° owing to temp. quenching.

N. Thon

450.51A METALLURGICAL LITERATURE CLASSIFICATION

80001 57063108 102002-101 209 001 011110102 01.111 001 009 011



CA

Effect of the temperature of heating and of the concentration of the activator on the law of the temperature quenching of the luminescence of phosphors. P. I. Vergunov and F. P. Gavrilov (Tomsk State Univ.). *Zh. tekh. fiz.* 20, 221 (1950).—Curves of the intensity I of the given (Cu) luminescence band of ZnS-Cu phosphors with Cu contents varying between 10^{-2} and 10^{-4} g./g., heat-treated under identical conditions, show constancy in an intermediate temp. range (satn. luminescence), and falling off both at higher and at lower temps.; the low-temp. drop was not directly observed with the highest Cu contents of 10^{-2} and 10^{-3} , but may possibly exist at temps. below the range of observation. The satn. portion of the curve and the high-temp. drop fit the formula $I = I_0 / (1 + C e^{-U/kT})$, where I_0 = satn. intensity, U = activation energy of quenching. From the exptl. data, with Cu = 10^{-2} , 10^{-3} , 10^{-4} , 10^{-5} , and 10^{-6} g./g., $U = 1, 1, 1, 1, 0.6$, and 0.6 , $10^3 C = 3.9, 3.6, 1.97, 0.76, 0.11$, and 0.04 . Up to the optimum concn. N of the activator, U is const., but decreases beyond the optimum N . The coeff. C decreases with increasing N according to $C = C_0 N^2$, i.e. temp. quenching begins the earlier, the lower N . At const. N , but with increasing temp. of heating in the

prepn. of the phosphor, both U and C increase, e.g., for phosphors heated to 700, 900, 1000, 1100, and 1200°, $U = 0.45, 0.50, 0.57, 0.67$, and 0.72 e.v., $10^3 C = 5.55, 6.0, 10.0, 148$, and 110 . With phosphors heated to lower temps., quenching starts earlier. The dependence of I on the intensity of excitation E can be described by assuming inverse proportionality between C and \sqrt{E} , which gives $I = E(1 + C_0 E^{-1/2} e^{-U/kT}) / (1 + C_0 E^{-1/2} e^{-U/kT})$, confirmed by exptl. data. The efficiency of luminescence is independent of E (varied by a factor of 100) at room temp., i.e. in the temp. range of satn. luminescence (except for a fall at very low E), but decreases with E , proportionally to \sqrt{E} , in the range of temp. quenching (e.g. at 500 K.). For the blue (Zn) band of ZnS-Cu, with Cu = 10^{-2} , 10^{-3} , and 10^{-4} g./g., $U = 0.13, 0.18$, and 0.17 e.v., $10^3 C = 4.6, 3.32$, and 0.73 , resp. Consequently, presence of Cu renders the blue band less temp.-resistant. N. Thon

AUTHOR

STRIGANOV A.R., GAVRILOV F.F., YEFREMOV S.P.

PA - 2721

TITLE

A Method for the Qualitative Spectral Analysis of Isotope Compositions of Enriched Uranium. (Metod spetral'nogo kolichestvennogo analiza izotopnogo sostava obogashchennogo urana.- Russian.)

PERIODICAL

Atomnaya Energiya 1957, Vol 2, Nr 4, pp 337 - 344 (USSR).

Received: 5/1957

Reviewed: 6/1957

ABSTRACT

The authors developed a photographic method for the spectral analysis of the isotope composition of enriched uranium at concentrations of from 2 to 90 % U^{235} and higher. The possibilities of this method and its advantage compared with other methods are shown here by the example of uranium. Besides, the present work carries out an experimental examination of the calibration curves used for the analysis of the isotopes of heavy elements.

Experiment: The glass three-prism spectrograph ISP-51 with the autocollimation chamber UF-85 (F = 1300 mm) served as spectrocope. An alternating current arc served as a light source. Liquid samples in form of an aqueous solution of nitric acid uranium salt was best suited. Solutions of the salts of natural as well as of enriched uranium were used for the composition of the two-isotope standards $U^{235} + U^{238}$.

CARD 1/2

A Method for the Qualitative Spectral Analysis of Isotope Compositions of Enriched Uranium. PA - 4/41

Selection of the spectral line: For the isotope analysis of uranium the line $4244,374 \text{ \AA}$ of the uranium is best suited because it belongs to the group of the most sensitive lines and has a high isotope shift. Besides, this line is located in a domain that is free from cyanogen bands. A photograph shows the well separated components of this line corresponding to the isotopes

U^{235} and U^{238}

. The scheme of transitions and the isotope structure of this line are shown in form of a diagram. A formula is given and discussed for the calibration curves. Microphotographs of the spectra of three uranium samples enriched with 2,82, 9,52 and 50% are added. The results found here determine sufficiently well the general deliberations concerning the course of the calibration curves in the case of the existence of a background and the reciprocal location of the isotope lines.

In conclusion, carrying out of the analysis and the accuracy of the method are discussed. This method is at least as accurate and essentially quicker than the other methods. Total analysis of a sample does not take longer than 1 hour. (8 illustrations and 2 tables.)

CARD 2/2

ASSOCIATION: not given.
PRESENTED BY: -
SUBMITTED: 20.7. 1956.
AVAILABLE: Library of Congress.

AUTHOR: Gavrilov, F.F.

SOV/51-7-3-1/21

TITLE: A Method of Spectral Isotopic Analysis of Lithium

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 3, pp 285-288 (USSR)

ABSTRACT: The author describes a spectral method, developed in 1953-5, of isotopic analysis of lithium. The Li I line at 6707.86 Å was used for this purpose under conditions which ensure the absence of re-absorption. The method does not require the use of standard samples with known isotopic composition. The isotopic structure was resolved by means of a Fabry-Perot etalon crossed with a diffraction spectrograph DS-1 (slit width 0.1 mm). A water-cooled hollow-cathode gas-discharge tube (Fig 1) was used as the light source. The discharge occurred in a current of helium at 2 mm Hg pressure, with 300 mA passing through the tube. A thin layer of lithium was deposited electrolytically on the polished end of a rod which served as the bottom of the hollow cathode. Best results were obtained with samples of 3×10^{-6} g weight: re-absorption of light is then very small. Spectra were recorded on a panchromatic film (exposure time was 10 min). The isotopic structure of the 6707.86 Å line is shown in Fig 2. Theory predicts that the ratios of the intensities

Card 1/3

A Method of Spectral Isotopic Analysis of Lithium

SOV/51-7-3-1/21

of the doublet lines are $I_a/I_b = I_c/I_d = 2$ (the subscripts "a" and "b" refer to the Li^7 isotope, and the subscripts "c" and "d" refer to Li^6). The concentrations of the lithium isotopes can be determined by comparing the intensities of the components a and d (variant I), components a and b + c (variant II) or the components b + c and d (variant III). Each of those variants is useful in a certain range of lithium isotope concentrations. To carry out measurements in a wider range of concentrations a variant IV can be used. In this variant the etalon thickness is 0.721 cm, which ensures coincidence of the components d and a and consequently the line structure will be in the form of equidistant lines (lower part of Fig 3). Fig 4 is a spectrogram of a sample with natural relative abundance of the lithium isotopes; it was obtained with the etalon separation of 0.706 cm. The systematic error which was due to incomplete coincidence of the line structure components at this etalon thickness was allowed for separately. To minimize the errors in the analysis due to inexact value of the contrast factor γ of the photographic film, the author used a special two-section multi-step attenuator. This attenuator was placed at the spectrograph slit, with its steps parallel to the interference bands. The author describes how to use this attenuator to find the value of γ . To check the method and find its precision the

Card 2/3

Method of Spectral Isotopic Analysis of Lithium

SOV/51-7-3-1/21

author analysed many times lithium samples with the naturally occurring proportions of isotopes. The results obtained for 25 samples are given in a table on p 288. The mean value of the Li^6 concentration in 25 samples was $7.6 \pm 0.2\%$. The relative abundance Li^7/Li^6 is, therefore, 12.2 ± 0.3 . The Li^6 concentration quoted above agrees, within the experimental error, with the results of mass-spectrometric studies. The spectral method described here was used also to analyse other samples of lithium with Li^6 concentrations of 33.3, 35.1, 59.0, 66.7 and 89.6%. The experimental error in all these spectral determinations did not exceed 0.2%. Additional tests showed that the presence of impurities in proportions of up to several per cent did not affect the results obtained. Acknowledgments are made to A.R. Striganov and V.I. Malyshev for their advice and to Yu.P. Mazarov and M.I. Fedorovskaya for their help in experimental work. There are 5 figures, 1 table and 6 references, 1 of which is Soviet, 1 English, 1 Dutch and 3 mixed (English, German and international).

SUBMITTED: December 4, 1958

Card 3/3